

U.S. Patent Application No. 09/914,752
Amendment dated February 9, 2004
Amendment and Response to First Office Action of October 9, 2003

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing Of The Claims

1. (Original) A multi-phase detergent tablet for use in a washing machine, the tablet comprising a first phase in adhesive contact with one or more second phases, and wherein at least the first phase is in the form of a compressed particulate solid incorporating a cogranulated detergency additive composition comprising polymeric polycarboxylate and inorganic carrier, and wherein the at least one second phase is in the form of a compressed particulate solid, and the first phase is formed by compression at a pressure greater than that of the at least one second phase.

2-23. (Previously Canceled)

24. (Currently Amended) A multi-phase detergent tablet according to claim 1 wherein the cogranulated detergency additive composition comprises i) from about 0.1% to about 60% by weight thereof of the polymeric polycarboxylate, ii) from about 40% to about 99.9% by weight thereof of the inorganic carrier, and iii) from 0% to about 50% by weight thereof of one or more organic auxiliaries selected from the group consisting of chelating agents, surfactants, polymeric disintegrants, solubility aids, and mixtures thereof, and wherein the cogranulated detergency additive composition comprises at least about 5% by weight of the tablet.

25. (Previously Presented) A multi-phase detergent tablet according to claim 24 wherein the cogranulated detergency additive composition comprises i) from about 1% to about 25% by weight thereof of the polymeric polycarboxylate, ii) from about 70% to about 99% by weight thereof of the inorganic carrier, and iii) from about 0.5% to about 20% by weight thereof of said one or more organic auxiliaries, and wherein the cogranulated detergency additive composition comprises from about 10% to about 80% by weight of the tablet.

26. (Previously Presented) A multi-phase detergent tablet according to claim 25 wherein the cogranulated detergency additive composition comprises i) from about 5% to about 20% by weight thereof of the polymeric polycarboxylate, and ii) from about 80% to about 95% by weight thereof of the inorganic carrier, said inorganic carrier comprising one or more inorganic salts, and wherein the

U.S. Patent Application No. 09/914,752
Amendment dated February 9, 2004
Amendment and Response to First Office Action of October 9, 2003

cogranulated detergency additive composition comprises from about 20% to about 60% by weight of the tablet.

27. (Currently Amended) A multi-phase detergent tablet according to claim 24 wherein the polymeric polycarboxylate is selected from the group consisting of:

- i) homo- and copolymers of one or more carboxylic monomers selected from the group consisting of acrylic acid, methacrylic acid, alpha-chloroacrylic acid, alpha-hydroxyacrylic acid, maleic acid, itaconic acid, and mixtures thereof; and
- ii) copolymers of one or more of the above carboxylic monomers with one or more nonionic monomers selected from the group consisting of acrylamide, acrylonitrile, vinyl esters, methylvinyl ketone, acrolein, styrene and alpha-methyl styrene, alkyl vinyl ethers, esters and amides of carboxylic monomers, water-soluble salts, and mixtures thereof;
- iii) water-soluble salts of lactic acid, glycolic acid, and ether derivatives thereof; succinic acid, malonic acid, (ethylenedioxy) diacetic acid, maleic acid, diglycolic acid, tartaric acid, tartronic acid, fumaric acid, the ether carboxylates and sulfinyl carboxylates thereof; citrates, aconitrates, citraconates, and the succinate derivatives thereof; oxypolycarboxylates; and mixtures thereof; and
- iv) mixtures thereof.

28. (Currently Amended) A multi-phase detergent tablet according to claim 24 wherein the inorganic carrier is selected from the group consisting of alkali metal silicate, alkali metal carbonate, alkali metal bicarbonate, alkali metal sesquicarbonate, alkali metal sulfate, alkali metal tripolyphosphate, and mixtures thereof, and wherein the inorganic carrier is in the form of a powder or mixture of powders having a weight-average particle size of less than about 200 μ m.

29. (Previously Presented) A multi-phase detergent tablet according to claim 28 wherein the inorganic carrier is in the form of a powder or mixture of powders having a weight-average particle size of less than about 150 μ m.

30. (Previously Presented) A multi-phase detergent tablet according to claim 1 wherein the cogranulated detergency additive composition comprises i) from about 1% to about 25% by weight thereof of the polymeric polycarboxylate, ii) from about 30% to about 85% by weight thereof of alkali

U.S. Patent Application No. 09/914,752

Amendment dated February 9, 2004

Amendment and Response to First Office Action of October 9, 2003

metal carbonate, alkali metal bicarbonate, alkali metal sesquicarbonate, and mixtures thereof, iii) from about 13% to about 69% by weight thereof of alkali metal sulfate, and iv) from 0% to about 5% by weight thereof of an organic chelating agent.

31. (Previously Presented) A multi-phase detergent tablet according to claim 30 wherein the cogranulated detergency additive composition comprises i) from about 5% to about 20% by weight thereof of the polymeric polycarboxylate, ii) from about 45% to about 65% by weight thereof of alkali metal carbonate alkali metal bicarbonate, alkali metal sesquicarbonate, and mixtures thereof, and iii) from about 15% to about 50% by weight thereof of alkali metal sulfate.

32. (Currently Amended) A multi-phase detergent tablet according to claim 24 wherein the organic chelating agent is selected from the group consisting of diethylenetriamine penta (methylene phosphonate), ethylenediamine tetra(methylene phosphonate) hexamethylenediamine tetra(methylene phosphonate), ethylene diphosphonate, hydroxy-ethylene-1,1-diphosphonate, nitrilotriacetate, ethylenediaminetetracetate, ethylenediamine-N,N'-disuccinate, methylglycinediacetic acid in their salt and free acid forms, and mixtures thereof.

33. (Currently Amended) A multi-phase detergent tablet according to claim 24 wherein the polymeric disintegrant is selected from the group consisting of starch, cellulose and derivatives thereof, alginates, sugars, polyvinylpyrrolidones, swellable clays, and mixtures thereof.

34. (Previously Presented) A multi-phase detergent tablet according to claim 24 wherein the solubility aid is a water-soluble hydrated salt having a solubility in distilled water of at least about 25g/100g at 25°C.

35. (Currently Amended) A multi-phase detergent tablet according to claim 34 wherein the solubility aid is selected from the group consisting of hydrates of sodium acetate, sodium potassium tartrate, sodium citrate, and mixtures thereof.

36. (canceled)

37. (Currently Amended) A multi-phase detergent tablet according to claim ~~36~~ 1 wherein the first phase is compressed at a pressure of at least about 40 kg/cm².

U.S. Patent Application No. 09/914,752

Amendment dated February 9, 2004

Amendment and Response to First Office Action of October 9, 2003

38. (Previously Presented) A multi-phase detergent tablet according to claim 37 wherein the first phase is compressed at a pressure of at least about 350 kg/cm² and wherein the second phase is compressed at a pressure of less than about 350 kg/cm².

39. (Previously Presented) A multi-phase detergent tablet according to claim 38 wherein a) the first phase is in the form of a shaped body having at least one mould therein; and b) the second phase is in the form of a particulate solid compressed within said mould.

40. (Previously Presented) A method of making the multi-phase detergent tablet of claim 1 comprising admixing a liquid feed comprising the polymeric polycarboxylate with a powder feed comprising the inorganic carrier and subjecting the mixture to conditions of agitation and heat to form cocranules of the detergency additive composition.

41. (Previously Presented) A method according to claim 40 wherein the liquid feed and powder feed are admixed under essentially non-evaporative conditions to form a wet cocranular output stream and wherein the wet cocranular output stream is subsequently subjected to heat-drying.

42. (Previously Presented) A method according to claim 41 wherein the liquid feed comprises the polymeric polycarboxylate in the form of a solution, dispersion, slurry, or emulsion in a liquid or liquifiable medium, wherein the powder feed comprises the inorganic carrier in the form of a powder or mixture of powders having a weight-average particle size of less than about 200µm, and wherein the liquid:powder feed ratio is less than about 0.5.

43. (Previously Presented) A method according to claim 42 wherein the powder feed comprises the inorganic carrier in the form of a powder or mixture of powders having a weight-average particle size of less than about 150µm, and wherein the liquid:powder feed ratio is from about 0.1 to about 0.35.

44. (Previously Presented) A method according to claim 43 wherein the powder feed comprises a mixture of alkali metal carbonate and alkali metal sulfate in a weight ratio of from about 3:1 to about 1:3.

U.S. Patent Application No. 09/914,752

Amendment dated February 9, 2004

Amendment and Response to First Office Action of October 9, 2003

45. (Currently Amended) A method according to claim 40 wherein the cogranular detergency additive composition has an apparent density in the range from about 400 to about 1100 g/l, a median granule size of from about 400 to about 700 μm , and a size distribution such that no more than about 5% by weight is greater than about 1500 μm and at least about 95% by weight is greater than about 200 μm .

46. (Previously Presented) A method according to claim 45 wherein the cogranular detergency additive composition has an apparent density in the range from about 600 to about 900 g/l and a median granule size of from about 450 to about 650 μm .

47. (Previously Presented) A method according to claim 40 comprising the steps of compacting the cogranules, optionally with other detergent tablet ingredients, to form the first phase of the tablet, superposing the second phase in particulate or tablet form on or over the first phase and thereafter further compacting the first phase and superposed second phase to form the final multi-phase detergent tablet.

48. (Currently Amended) A method of making a cogranular detergency additive composition comprising admixing a liquid feed comprising a polymeric polycarboxylate with a powder feed comprising inorganic carrier and subjecting the mixture to conditions of agitation and heat, and wherein the polymeric polycarboxylate is in the form of a solution, dispersion, slurry, or emulsion in a liquid or liquifiable medium, the inorganic carrier is in the form of a powder or mixture of powders having a weight-average particle size of less than about 200 μm , and wherein the liquid:powder feed ratio is less than about 0.5; wherein the powder feed comprises a mixture of alkali metal carbonate and alkali metal sulfate in a weight ratio of from about 3:1 to about 1:3.

49. (Previously Presented) A method according to claim 48 wherein the inorganic carrier is in the form of a powder or mixture of powders having a weight-average particle size of less than about 150 μm , and wherein the liquid:powder feed ratio is from about 0.1 to about 0.35.

50. (Currently Amended) A cogranulated detergency additive composition comprising i) from about 0.1% to about 60% by weight of polymeric polycarboxylate, ii) from about 40% to about 99.9% by weight of inorganic carrier in the form of a powder or mixture of powders having a weight-average particle size of less than about 200 μm , and iii) from 0% to about 50% by weight of one or more

U.S. Patent Application No. 09/914,752

Amendment dated February 9, 2004

Amendment and Response to First Office Action of October 9, 2003

organic auxiliaries selected from the group consisting of chelating agents, surfactants, polymeric disintegrants, solubility aids, and mixtures thereof; wherein the powder comprises a mixture of alkali metal carbonate and alkali metal sulfate in a weight ratio of from about 3:1 to about 1:3.

51. (Previously Presented) A cogranulated detergency additive composition according to claim 50 comprising i) from about 1% to about 25% by weight of the polymeric polycarboxylate, ii) from about 70% to about 99% by weight of the inorganic carrier in the form of a powder or mixture of powders having a weight-average particle size of less than about 150 μ m, and iii) from 0.5% to about 20% by weight of said one or more organic auxiliaries.

52. (Previously Presented) A cogranulated detergency additive composition according to claim 51 comprising i) from about 5 to about 20% by weight of the polymeric polycarboxylate, and ii) from about 80% to about 95% by weight of the inorganic carrier.

53. (Previously Presented) A cogranulated detergency additive composition according to claim 50 comprising from about 5% to about 20% by weight of the polymeric polycarboxylate and from about 80% to about 95% by weight of the inorganic carrier, and wherein the inorganic carrier comprises i) from about 45% to about 65% by weight of the additive composition of alkali metal carbonate, alkali metal bicarbonate, alkali metal sesquicarbonate, and mixtures thereof, and ii) from about 15% to about 50% by weight of the additive composition of alkali metal sulfate.